NYBORG 12/24

user manual

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Introduction

Congratulations on buying the Nyborg synthesiser. Nyborg is part of the Analogue Solutions range of analogue music equipment. Nyborg is a precision electronic musical instrument. It combines all the often needed music electronic circuitry to make a music synthesiser in one compact module.

No compromise has been made with the construction of Nyborg. Cheaper options in parts have not been used

- Full rugged steel/aluminium case - no plastic mouldings
- Good quality smooth potentiometers, fully sealed against dust
- Good quality knobs with spun aluminium caps
- High grade double sided circuit board
- High Quality 16bit DAC for MIDI-CV conversion
- Very stable MIDI to CV
- Very stable analogue oscillators
- Hand built by humans
- True retro analogue voice and modulation circuits to give an authentic retro sound

WHY DO I NEED THIS SYNTH? WHAT'S SO SPECIAL?

Nyborg is a compact true analogue mono synth in a neat, smart, small package.
When we say 'real analogue' we mean that the entire audio patch and all modulation is entirely analogue, using circuits based on awesome sounding vintage 1970s designs. There circuits are not locked down by CPUs, controls are quantised and read by CPUs. With exception of the MIDI to CV circuit, which by its nature must have a digital element, Nyborg really is analogue and the sound benefit is immediately apparent!
We get may good comments about how good Analogue Solutions sound, how good, warm and full of character they are.
The synth has been designed by a musician who is a big fan of electronic music, and knows how to program a synth, not designed by an engineer. So, the modulation choices and range of sounds they produced have all been carefully thought out and quickly give you those sounds you want: huge bass, synth leads, percussion, effects, modular style sounds.

What are the Differences Between Nyborg-12 and Telemark?

They essentially share the same circuits, so will sound similar. The main differences are outlined below:

Nyborg12 Advantages / Additions
Octave switches on the VCO.
'Free run' setting - disconnects VCO from MIDI pitch. Good for effects or using the VCO as a modulator.
Wide setting - allowing the VCO Tune knob to have a super wide range - good for when the VCO is used as a modulator.
Q Boost on the filter - to make resonance go insane.
VCO Sub Osc is hard wired to the Mixer - for super convenience.
Much smaller than Telemark - for those with limited space.
Lower price point.
Two Nyborgs can be racked side by side using the optional rack kit,

Telemark Advantages / Additions
Plenty of signal patch points! Telemark can be more fully integrated into an existing modular system. Cross patching between the two is possible.
The patch points enable additional modulation, effects and sounds that cannot be done with the switches alone.
Ring Modulation.
The Sub Osc is not hard wired. This means it can be patched up in other ways, like a clock divider, or to half the rate of the LFO square wave.

So in summary - which to choose?

Main points are
Size
Cost
Do you want the advantages the extra sockets give?
There are points personal to your situation!

If price and size are not an issue - then
Nyborg - the fact it has Sub Osc hard wired allows a wider range of sounds to be made without patching.
Telemark - it will do far more, but requires the work of patching.
So the summary here is Telemark will do much more than Nyborg but requires the extra effort (some patching). Nyborg will do more than an un-patched Telemark.

Nyborg Layout

Note: Nyborg24 is just about identical. But see notes on filter section.

NYBORG: SYNTH – PERCUSSION – AUDIO PROCESSOR

Nyborg is a compact analogue synthesizer. Analogue - as in really analogue. Aside from the MIDI chip (which has to be digital), everything else is totally analogue using real transistors and op-amps. There are no CPU stabilised and quantised circuits, no DCOs, no digital LFOs and no digital EGs, as found on other so called analogue synths. The circuitry is based on designs dating back to the mid-1970s. So Nyborg has a genuine old sound.

Audio Applications

MONO SYNTHESISER

Nyborg is for use any time you need analogue sound effects, fat basses, screaming leads, beeps, tones, zaps, and all the other crazy sounds associated with analogue synthesis. Use in place of your boring digital synths and DSP soft synths.

EFFECTS PROCESSOR

Nyborg has an audio input socket, so you can feed external sounds through the on-board analogue filters for analogue processing.

DRUM SYNTHESISER

Nyborg is able to produce electronic percussion – kick, snare, hihats, cymbal, etc.

MODULAR SYNTHESISER

Nyborg is pre-patched – but has such a wide range of modulation routing possibilities that it is almost as versatile as a modular and can produce the same types of sounds, without the mess and confusion of cables. It has some patch sockets that enable you to connect it to an external modular.

POLYSYNTH

It's possible to daisy-chain two Nyborg together and play them as a two voice poly-synth. It's even possible to bolt the two units together and fit them in a 19" rack (using optional rack ears).

It's possible too to use four units as a four voice polysynth (using optional software, since as standard, only two units can be daisy-chained).

MIDI (DAW Use) or CV & Gate?

This unit can be used with a MIDI keyboard (or DAW, or sequencer) or you can use it with an analogue sequencer, such as Oberkorn.

It can also be used by MIDI and CV at the same time! So you could have an analogue step sequencer such as Oberkorn playing a little melody, then using a MIDI keyboard (or MIDI sequencer) transpose the Oberkorn sequence.

Circuits Included

Oscillators

There are two VCOs – each providing a wealth of features and modulation choices.

Controls include: TUNE, OCTAVE, MODULATION depth and destination, MOD. SOURCE (EGs, VCO audio, External CV, LFO), manual pulse WIDTH, VCO Sync

Low Frequency Oscillator

The LFO has triangle and Square wave modulation signals. The MODE switch can also be used to route Sample And Hold or CV2 (velocity) signals to the VCF and VCOs.

Filter

Nyborg12 uses a 2 pole 12bB per octave multimode filter. What does this mean? It uses the same filter as the legendary Telemark synth, which is similar (but not the same, having its own character) to the old Oberheim SEM. The filter is actually four types in one. Low pass, Band pass, High pass and Notch filters.

Controls include: CUTOFF, RESONANCE, MODULATION depth (- and +), MOS.SOURCE (EG, LFO, VCO audio, External CV), KEY voltage, CV2 voltage (velocity), NOTCH high/low, FILTER TYPE (high, low, band, notch).

Nyborg24 uses a 4 pole 24dB ladder low pass filter. It uses the same filter as the awesome Leipzig synthesizer, which is similar (but not the same, having its own character) to the old vintage Moogs.

Mixer

Audio choices are the Saw or Square wave of each VCO, Noise or, for added fatness, Sub-Oscillator.

Amplifier

The VCA can be controlled from Gate or Envelope. It can be set to BYPASS so it is always 'open'. This allows Nyborg to be used as an effects processor. Finally there is a CYCLE option. This sets the envelope to be constantly re-triggered by the LFO allowing for hands-off sound effects.

Envelopes

There are two EGs – each having control over ATTACK, SUSTAIN, and combined DECAY/ RELEASE.

Modulation

Great thought has been placed into modulation route choices, allowing a wide range of sounds to be produced, including percussion and 'modular' style sounds.

MIDI

MIDI is intentionally kept simple – so you can concentrate on making new sounds and making music – not getting tied up with SYSEX programming.

You get the all important control over filter cut-off using MIDI Velocity (or a MIDI controller).

External CV Control Sockets

Nyborg can be controlled via an external analogue sequencer, such as Oberkorn, using the top panel CV sockets.

There are pitch CV sockets for each VCO PITCH1 and PITCH2, filter CUTOFF, GATE (to trigger the EGs), EXT (to feed an external CV to various circuits).

Also, on the rear panel are two spare 6.35mm big jack sockets. Using these you can route external audio through the filter. Set the VCA to BYPASS and use Nyborg as an effects processor!

Mounting Options

Nyborg can be orientated and configured in several ways;

VERTICAL (TALL)
As standard, it comes as a vertical desktop unit just like it's big brother Telemark.

HORIZONTAL (FLAT)
It is possible to reconfigure it so that it is a flat table top unit, like its cousin Leipzig-S is. This requires some minor screwdriver work.

WITH WOOD SIDES
In either of the above two configurations, optional wood side panels can be fitted. These screw on from the inside of the unit, so no ugly screws will be visible on the beautiful wood.

TWO (OR MORE!) SIDE BY SIDE
Two (or more!) units can be bolted side by side. And of course you can also fit the optional wood sides to these, or, reconfigure them to be horizontal flat units. Two units can be MIDI daisy chained for a duo-phone synth.

TWO UNITS RACKED
Two units can be bolted together (like above) and then you can also fit the optional rack ear brackets, and rack mount the whole assembly.

Safety Instructions

PLEASE READ CAREFULLY BEFORE USING:

- Only use the correct power adaptor - 230V for UK/EU (110V for N.America).
- Never handle the adaptor with wet hands
- Never excessively bend the adaptor cable or get it trapped or place heavy objects on it. If the adaptor cable becomes damaged, replace the adaptor.
- Ensure the unit is disconnected from the mains before moving or cleaning.
- Always disconnect the unit from the mains if there is lightning in your area.
- Ensure the unit is on a stable surface, and never place heavy objects on top of it.
- Never allow young children or animals to operate the unit or adaptor.
- Do not use excessive force when using the controls or inserting cables to the connectors.
- The unit should not be operated in the rain or near water and should not be exposed to moisture.
- If the unit is brought from a cold environment to a warm one, the unit should be left to reach the ambient temperature.
- Keep away from heat sources, such as radiators, ovens, heaters etc.
- Never allow it to get wet. Do not operate it near water, like pools, sinks, bathrooms etc.
- Do not place beverages on or near it.
- Never open the case or attempt to make repairs. Refer any servicing to qualified service personnel.

PREVENTING DAMAGE TO OTHER CONNECTED DEVICES

Nyborg has a very high dynamic range. It is capable of produce loud signals of very high and sub-sonic frequencies that could blow inadequate speakers if played too loud. It is recommended that input levels to external equipment (mixers, amp's etc.) are kept low when first connected, and then slowly increased to a useable level.

MAINTENANCE INSTRUCTIONS

Any cleaning of the Nyborg case should be done with a clean lint-free cloth.
DO NOT USE SOLVENTS OR CLEANERS, as this will deteriorate the exterior appearance of the equipment. Do not use a car wash or jet wash to clean this synth.

PLACE

Nyborg soundly on any stable surface so it cannot fall off or over, causing it or yourself injury.

POWER

The unit needs a 12 to 15V AC supply, minimum 500mA. DC Power supplies will not work.

Getting Started

POWER

Nyborg comes with a power supply. It uses a power supply with an AC output (not DC!)

If your power supply comes with a selection of connector plugs, use the one with the yellow coloured centre. You'll know it's the right one as the fit will feel right.

It does not matter which was around you insert the plug into the end of the power supply lead.

Plug the power leads into the rear of Nyborg.

MIDI

Nyborg has;

MIDI In	for sequencing from DAW or playing via MIDI keys.
MIDI Thru	outputs a copy of what comes into the MIDI In socket

Example set up;

Connect MIDI Out from your computer DAW MIDI interface or MIDI keyboard to MIDI In of Nyborg.

Optionally connect MIDI Thru from Nyborg to the MIDI In of another device.

Note;

If MIDI Thru appears not to work then Nyborg may be in Poly Chain mode. See that section in this manual on how to disable Poly Chain.

Initial Tuning

Once the MIDI and audio connections have been made it may be necessary to tune in the VCOs to the rest of your music set-up. Allow a five minute warm up time as these are true analogue VCOs – that's why they sound so great!

First set up the controls of Nyborg to make a simple sound. It is usually best to leave the VCA on BYPASS. Turn VCO2 to zero volume so you can only hear VCO1.

Play, say, middle C on the keyboard. Using a digital keyboard as a reference, adjust the tuning of VCO1 until it plays in tune with your reference.

Finally, turn up VCO2 so both VCOs can be heard. Using the tune controls of VCO2, tune it to VCO1.

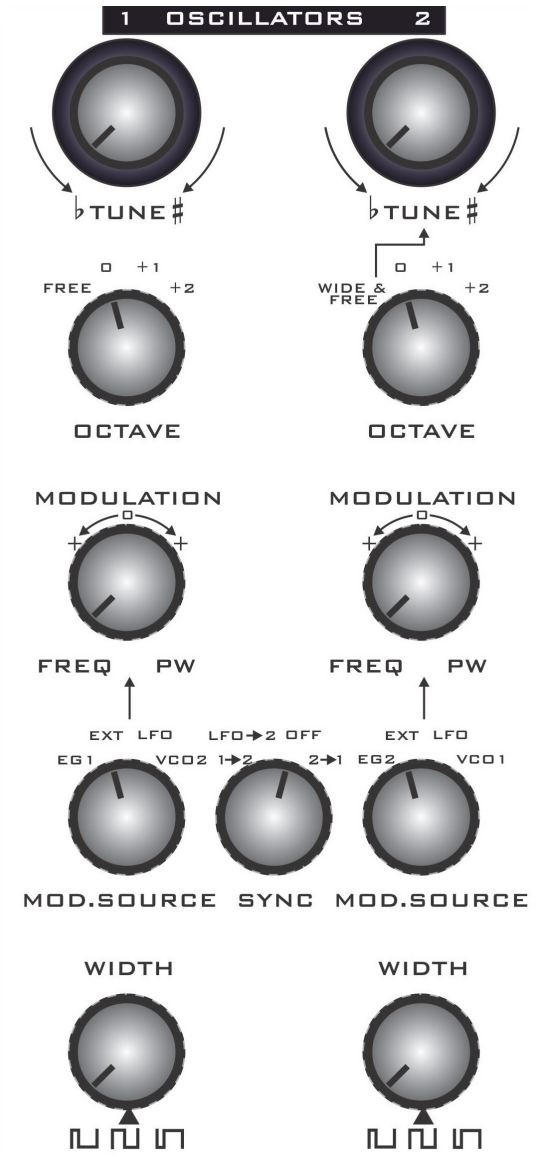
Circuits in Detail

Here follows details on the sockets and controls, with brief simplified explanations of what the circuits do. We have not gone into technical details on how or exactly what each circuit does but tried to explain each control's function and effect.

This synth has been designed to be simple and intuitive to use, just like the original analogue synth's of the 70s and 80s. There are no multi-layered menus to work through.

Anyone who has used synthesisers before should be familiar with the terms used and therefore be able to predict their behaviour and how they affect the sound. The best way to learn how to use Nyborg is to go straight ahead and play with it. Reading of this manual may only be necessary for finer operational detail.

VCO 1 & 2



The voltage controlled oscillators (VCOs 1 and 2) produce the raw audio waveform usually used as the initial source for sound creation.

They provide cyclic audio waveforms that can be pitched.

VCOs usually receive treatment from the VCF to turn their basic tones into pleasant sounds. Both VCOs have almost identical controls. Both are described below.

TUNE

Controls pitch adjustment of the VCO. Use this to tune the VCOs to each other, and to themselves.

OCTAVE

The VCOs can be transposed up one or two octaves.

When VCO1's Octave switch is on the first setting FREE, then MIDI-CV Pitch will no longer change the pitch.

FREE (run) allows VCO1 to be used like a LFO – that is as a CV control source, unaffected by pitch. Or, it is good for VCO Sync effects.

When VCO2's Octave switch is on the first setting WIDE, then the Tune range of the TUNE control becomes extremely wide. It will be harder to set a specific pitch, but the wide range allows some great effects when used in conjunction with other settings.

MODULATION

This controls the amount of modulation to either pulse width or pitch from the modulation source selected by the SOURCE switch.

Turn this knob clockwise in increasing amounts to apply pulse width modulation (PWM) to the VCO's square wave. This will have the effect of thickening up the VCO sound. Extreme settings of modulation may result in the sound cutting out (which can be used for creative effect!) Turn this knob anti-clockwise in increasing amounts to apply frequency modulation (FM) to the VCO. In a central position, there will be no modulation to either PW or Frequency

MODULATION SOURCE ROTARY SWITCH

This selects the modulation source for either PWM or FM and is routed to the control above.

The source options are;
EG1/2 For pitch sweeps. Good for percussion sounds.
EXT A signal patching into the EXT socket s used as a modulation source.
LFO For vibrato and trill effects
VCO2/1 For frequency modulation effects

PULSE WIDTH

This control allows manual shaping of the pulse wave output. It alters the pulse width (duty cycle) of the pulse wave. In a central position a square wave is produced (approx. 50% duty cycle). Try this control and listen to how the tone of the waveform changes. When using Pulse Width Modulation, it is best to set the Pulse Width control to centre, otherwise the sound may cut-out (which can be used for creative effect!)

SYNC

SYNC forces one VCO (the slave VCO) to start a new cycle each time the other does (the master VCO). This means that the slave VCO can only play the harmonics of the master. Particularly interesting effects can be made when the pitch of the slaved VCO is changed, for instance, by sweeping with an EG.

SYNC SWITCH

This switch selects the routings for oscillator sync. The options are: 1>2 VCO2 slaved to VCO1 LFO>2 VCO2 slaved to LFO OFF Off / no sync effect 2>1 VCO1 slaved to VCO2

Oscillator sync is where the master signal will reset the waveform of the slave signal each time the master waveform starts a new cycle.

Try the different settings and listen to their effect. You may have to modulate the pitch of either VCO1 or VCO2 to enhance the effect. There is a balancing act between the pitch of the two sound sources (usually the 2 VCOs) to get a good effect, once found you'll know you've found it!

Audio Mixer

NOISE GENERATOR

The noise generator produces white noise which contains all audible frequencies at equal volume. This is like the hiss you hear between radio stations. The signal is available for filtering via the Noise/Sub mixer control. Noise would be used for sound effects such as breath, wind, percussion, etc.

SUB OSC A sub oscillator is a signal taken from a VCO that is then taken down one or more octaves below the source VCO. In this case the Sub is taken from VCO1, and is one octave lower. Sub Osc is used typically for creating deeper and more powerful bass sounds. The Sub Osc waveform is a square wave.

MIXER

The mixer is used to bring various audio source signals together for filtering. There are 3 mixer controls.

SAW/PULSE VCO1 LEVEL

Turning the control clockwise in increasing amounts sends VCO1s pulse signal to the mixer. Turning the control anti-clockwise in increasing amounts sends VCO1s sawtooth wave signal to the mixer. In a central position no signal is sent from VCO1 to the mixer.

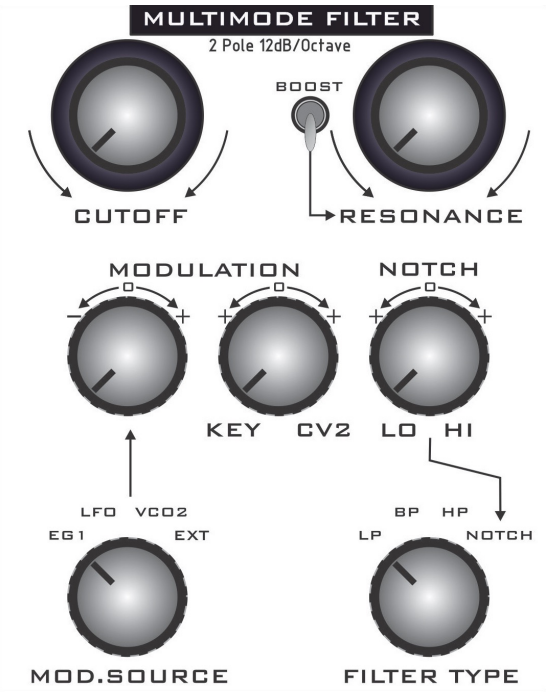
SAW/PULSE VCO2 LEVEL

Turning the control clockwise in increasing amounts sends VCO2s pulse wave signal to the mixer. Turning the control anti-clockwise in increasing amounts sends VCO2s sawtooth wave signal to the mixer. In a central position no signal is sent from VCO2 to the mixer.

NOISE / SUB LEVEL

Turning the control clockwise in increasing amounts sends the Sub Osc signal to the mixer. Turning the control anti-clockwise in increasing amounts sends white Noise to the mixer. In a central position no signal is sent from the Noise generator or Sub Osc to the mixer.

VCF - Nyborg-12



The voltage controlled filter (VCF) is used to alter the tone of the VCOs/Noise and is the heart of what gives an analogue synth its character.

The main character of the filter is a 2 pole, 12dB/Octave 'oberheim' style filter.

There are 4 types of filter available; Low Pass High Pass Band Pass Notch Pass (variable between Low/High)

FREQUENCY

This sets the cut-off frequency, the point at which the filter begins operating and will start to filter out harmonics.

RESONANCE

Resonance only acts at the filter cut-off point. The effect amplifies the frequencies around the cut-off point. As the control is increased to higher levels the filter will start to self-oscillate. Use Resonance to alter the tone of the filter effect. It can be used to create squidgy sounds, pulse hits and effects.

(RESONANCE) Q-BOOST

12dB filters typically don't have very 'strong' resonance. Not a bad thing, they just respond differently to 24dB filters.
Q BOOST increases the strength of the resonance and when the RESONANCE control is at full it will really scream!
The main use for this, in our view, is for cross modulation from the VCO:
Q Boost ON
RESONANCE at Maximum.
MOD SOURCE to VCO2
MOD amount to maximum.

With these settings the audio from VCO2 will modulate the filter. This sounds great with Q BOOST off, but with it on, it sounds wild!

MODULATION AMOUNT

Turning the control clockwise will increase the amount that the modulation source selected by the MOD.SOURCE switch (outlined below) will modulate the cut-off frequency. Turning the control anti-clockwise works just like clockwise except that the

modulation signal is inverted (negative). In a central position the selected modulation source will not affect cut-off modulation.

NOTCH

This sets the relative mix between the low pass and high pass filters that is fed to the Filter Type selection switch

MOD SOURCE ROTARY SWITCH

This selects the modulation source that will affect the filter cut-off and is routed to the control above.

There are 4 modulation sources;
EG1 EG1 is used as a modulation source. Use for tonal changes.
LFO LFO is used as a modulation source. Use for filter sweeps (wah-wah).
VCO2 Pulse wave of VCO2 is used as a modulation source. Use for effects.
EXT Signal at the EXT socket is used as a mod source. Use for external filter control.

FILTER TYPE ROTARY SWITCH

LP - Low Pass: Signals above the cut-off frequency are attenuated at a rate of 12dB/octave.

BP - Band Pass: Signals above and below the cut-off frequency are attenuated at a rate of 12dB/octave.

HP - High Pass: Signals below the cut-off frequency are attenuated at a rate of 12dB/octave.

Notch Notch: signals at the cut-off frequency are attenuated at a rate of 12dB/octave.

Nyborg-24 Filter

Since the Nyborg-24 does not have a multimode filter (not possible with its transistor ladder design) there are no need for the NOTCH and FILTER MODE switches. So these have been replaced with additional Modulation SOURCE and Modulation AMOUNT controls which work in the same kind of way as the other set.

Nyborg-24 does not have, or indeed need, a Q Boost switch. The 4 pole filter design gives a resonance characteristic that enables it to already heavily self-oscillator.

FILTERING EXTERNAL SOUND SOURCES

External sound sources, such as vocals, guitars, mixer sends, samplers, etc. can be sent through the filter for extra treatment. Note, mic's and guitars may need pre•amping use if the signal is too quiet.

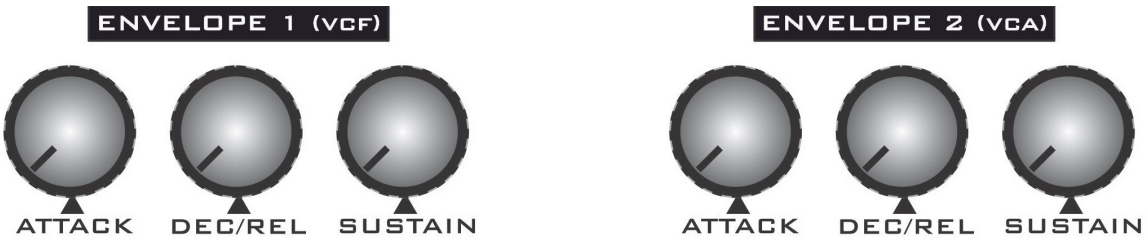
Simply plug the sound source into the front panel EXT4 socket.
Turn the mixer control Noise/EXT4 to EXT4, and up to a suitable level.
You may wish to return the VCO1 and VCO2 mixer controls to their centre positions so the VCOs cannot be heard.

Turn the VCA mode switch to ON. This will leave the VCA open so a constant signal can be heard.

Finally, play around with the filter and modulation settings as necessary. The VCO signals can also be introduced, and use the various VCA modes and envelopes if you wish to contour the sound level and add additional effects.

Note; The rear panel input sockets are wired direct to the mixer input.

Envelope Generators



EG1 ASR

EG1 is an ASR (attack / sustain / release) envelope generator. Use it to modulate various parameters of the synthesiser. EG1 is generally assigned for use with modulating VCO1 and the filter cut-off.

ATTACK

Controls the Attack time. This control sets the time the envelope signal will take to reach full level after the EG is initiated.

DEC/REL

Controls the Decay / Release time - the time it take the envelope signal to return to zero when the key is released.

SUSTAIN

Controls the level the envelope will hold at when a key is held.

EG2 ASR

EG2 is just the same as EG1. EG2 is generally assigned for use with modulating VCO2 and the VCA.

ATTACK

Controls the Attack time. This control sets the time the envelope signal will take to reach full level after the EG is initiated.

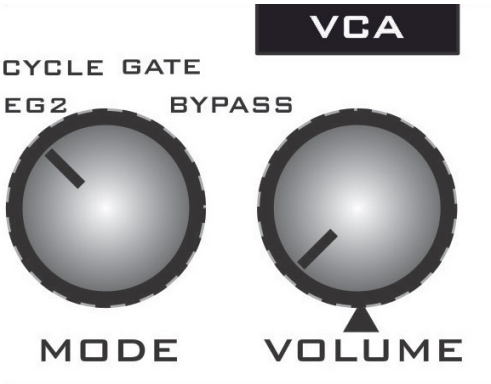
DEC/REL

Controls the Decay / Release time - the time it take the envelope signal to return to zero when the key is released.

SUSTAIN

Controls the level the envelope will hold at when a key is held.

VCA



The Voltage Controlled Amplifier (VCA) is the circuit that is used to change the output volume.

Normally an envelope signal would be used to do this, so the sound starts loud then gradually fades away.

The filter audio output is hard-wired to the VCA signal input.

MODE
ROTARY SWITCH

The VCA can be controlled in 4 modes

EG2

When EG2 is selected, the envelope signal of EG2 is used to modulate the VCA level. Use it if you require the VCA level to change over time. (Normal use).

LFO (REPEAT)

When this is selected, The LFO will constantly re-trigger (repeat) the envelope.

GATE

When GATE is selected, the MIDI note on/off information is used to modulate the VCA. With this, the VCA level is either off or full on. The audio envelope would be like an organ's, with no attack or decay time.

Top Tip!
The Gate in is really a VCA CV input - this means you can use this input to change the amplifier gain with a voltage (range approx 0 to 10V).

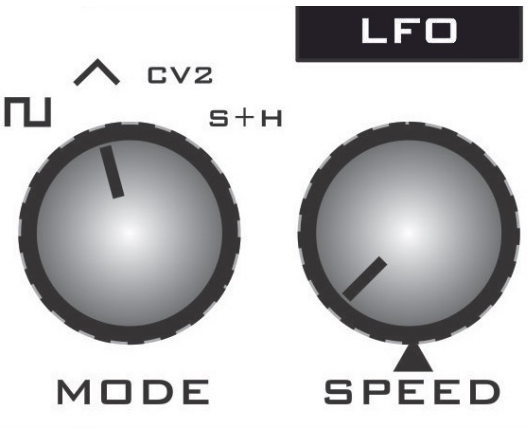
BYPASS

When BYPASS is selected, the VCA is left permanently on at full level. Use this setting if you wish to use the Filter as an effects processor, to process external audio fed into Nyborg via the EXT1 socket.

VOLUME

This sets the output level of Nyborg, i.e. the output from the VCA that is sent to the rear panel SIGNAL output socket.

LFO



The Low Frequency Oscillator (LFO) is basically identical to a VCO, it is another oscillator, except that it produces periodic wave forms of low frequency, typically sub-audio.

These slow cyclic waveforms are used for modulating other circuit parameters, for example, for sweeping the filter cut-off up and down, either slowly for a nice sweep, or faster for a 'wah-wah' type effect. It could be used to modulate the VCO pitch for vibrato.

The LFO block is grouped together with the VCOs as an LFO is an oscillator just like the VCOs are.

SPEED

This sets the frequency (speed) of the LFO which is indicated by the LED.

MODE – ROTARY SWITCH

This sets the modulation source that is routed to LFO points for modulation selection.

The options are:
LFO Square Wave CV2 (Midi Control) LFO Triangle Wave S&H (Sample & Hold)

Sample and Hold (S+H) on this synth means a modulation signal is created that has a new random signal level each time the LFO completes a cycle (each time the LFO LED lights up a new modulation level is set).

Patch Sockets

PATCH NAME:
PROJECT:
COMMENTS:
nyborg
ANALOGUE SOLUTIONS
NYBORG PATCH SHEET
www.analoguesolutions.com

PATCH SOCKETS

Nyborg has some 3.5mm mono CV sockets on the top panel to allow optional patching some essential signal.

Typically you might want to use these to control the synth from an analogue sequencer, such as Analogue Solutions Oberkorn.

PITCH1

This is a 1V/Octave pitch CV input to control VCO1's pitch from an external source, such as the Oberkorn analogue sequencer.

PITCH2

This is a 1V/Octave pitch CV input to control VCO2's pitch from an external source, such as the Oberkorn analogue sequencer.

CUTOFF

This is a frequency cutoff CV input to control the filter's cutoff point from an external source, such as the Oberkorn analogue sequencer.

GATE

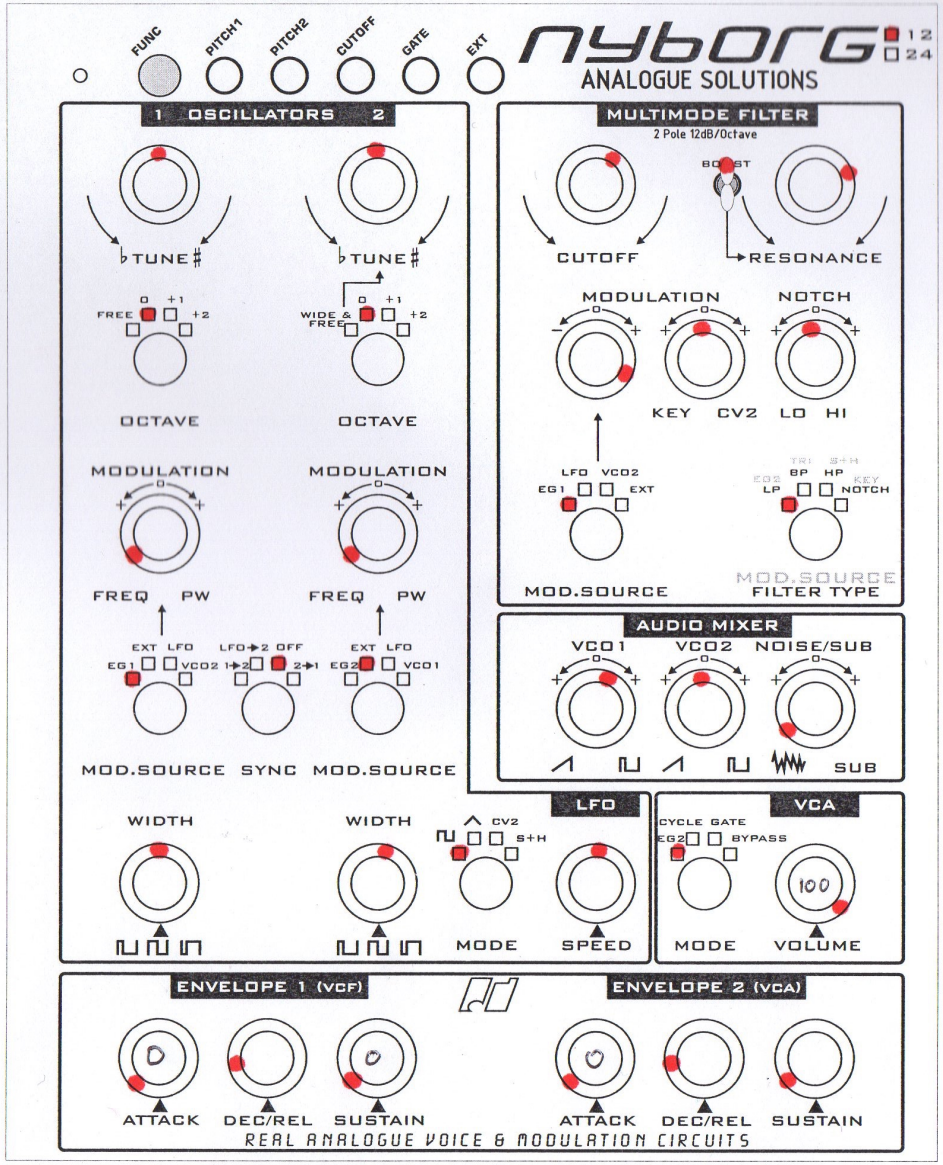
This is a Gate input to trigger the two Envelopes from an external gate, such as the Oberkorn analogue sequencer Gate X/Y outputs.

EXT

This is control voltage input to allow external CV signals to be patched into the synth. The routing is then selected via the various MODULATION SOURCE rotary switches. Use a voltage from an external source, such as the Oberkorn analogue sequencer CV outputs.

PATCH NAME: SYNTH SNARE Drum COMMENTS: .....

PROJECT: ....



SET CV2 TO: ☒ VELOCITY ☐ .....

NYBORG PATCH SHEET

www.analoguesolutions.com

NOTES: USE COLOURED PENS FOR CLARITY! USE YOUR PATCH SHEETS AS GUIDES ONLY, SINCE WITH A PEN YOU CAN ONLY BE SO ACCURATE.
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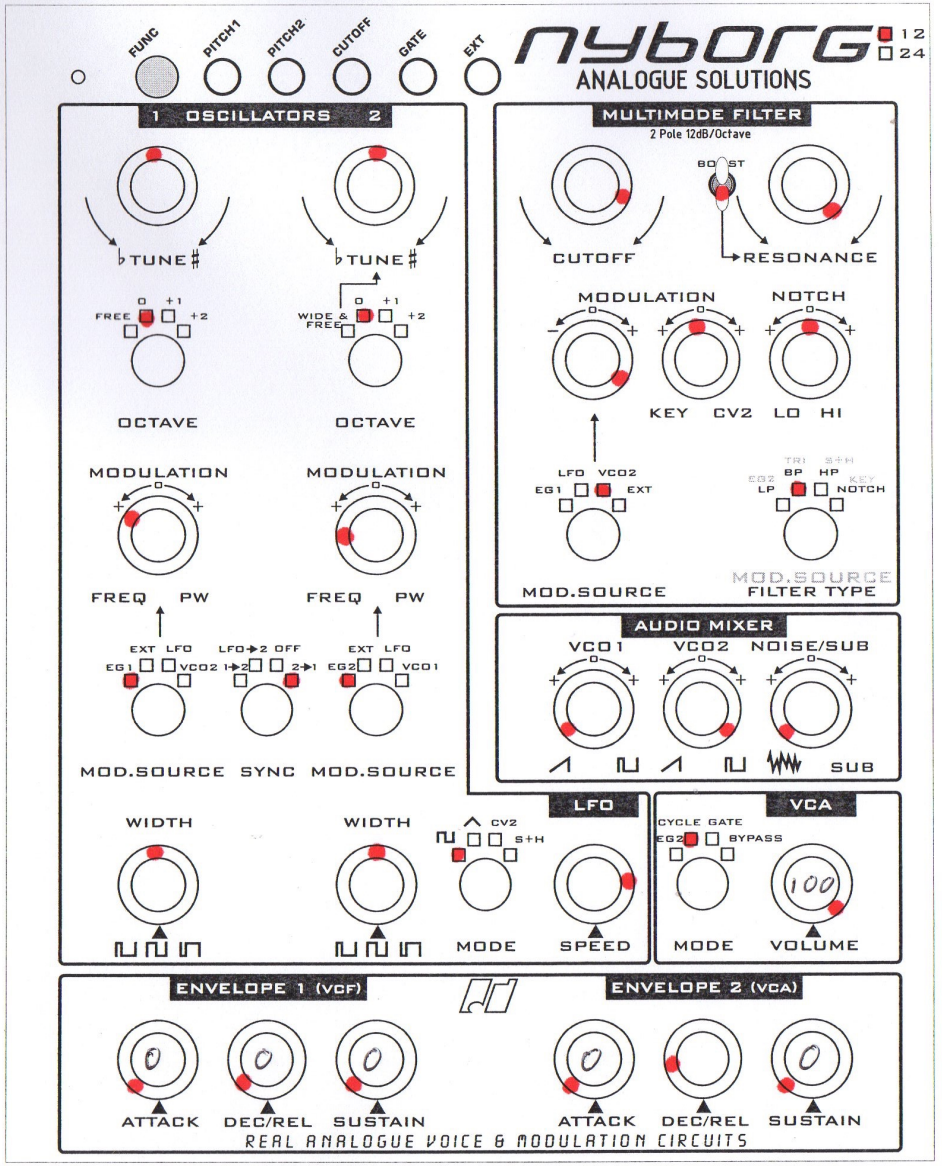
ENSURE CV2 IS CORRECTLY SET.
WHEN COPYING A PATCH - PLAY WITH SETTINGS!

PATCH NAME: VEXED TAMBOURINÉ COMMENTS: .....

PROJECT: ....



SET CV2 TO: ☒ VELOCITY ☐ .....

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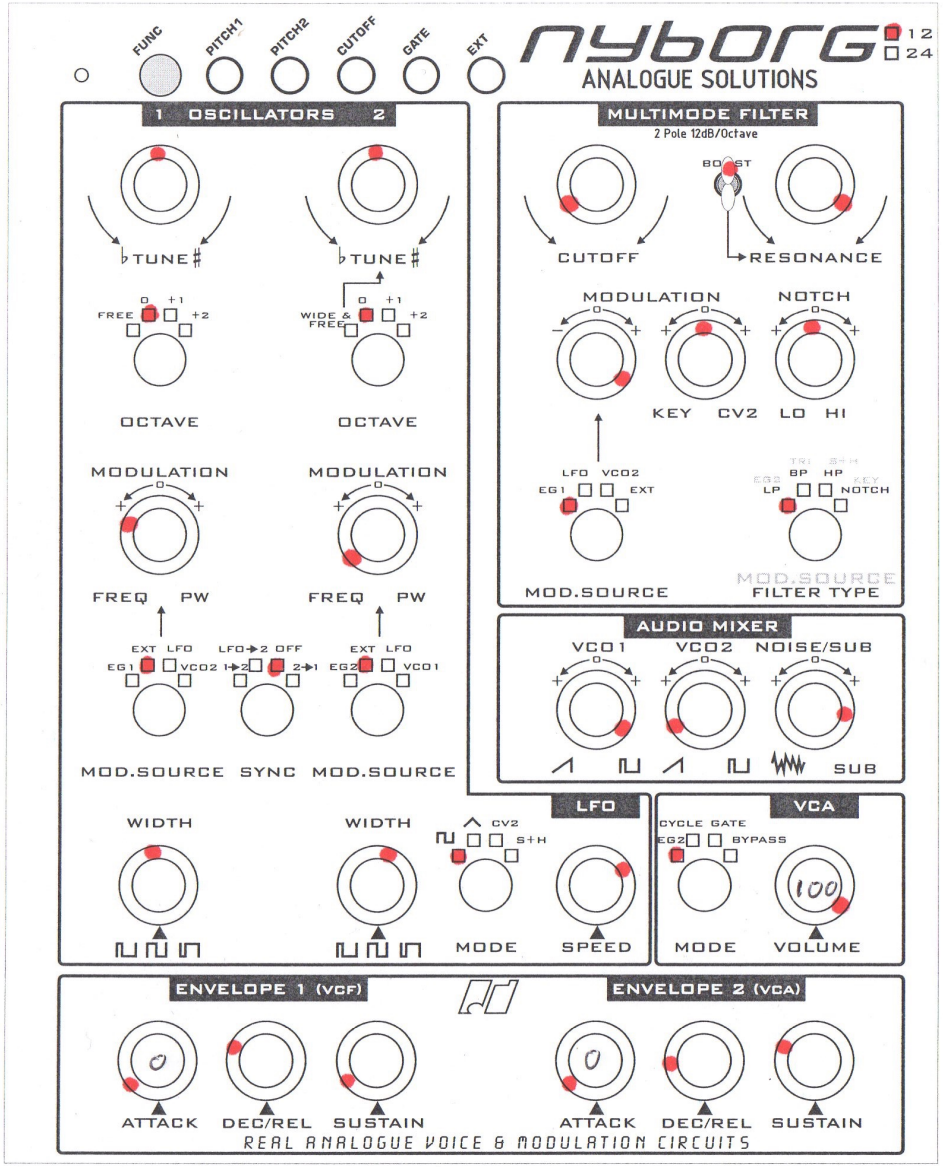
PATCH NAME: THE FUNK! COMMENTS:

PROJECT:



SET CV2 TO: ■ VELOCITY □ .....

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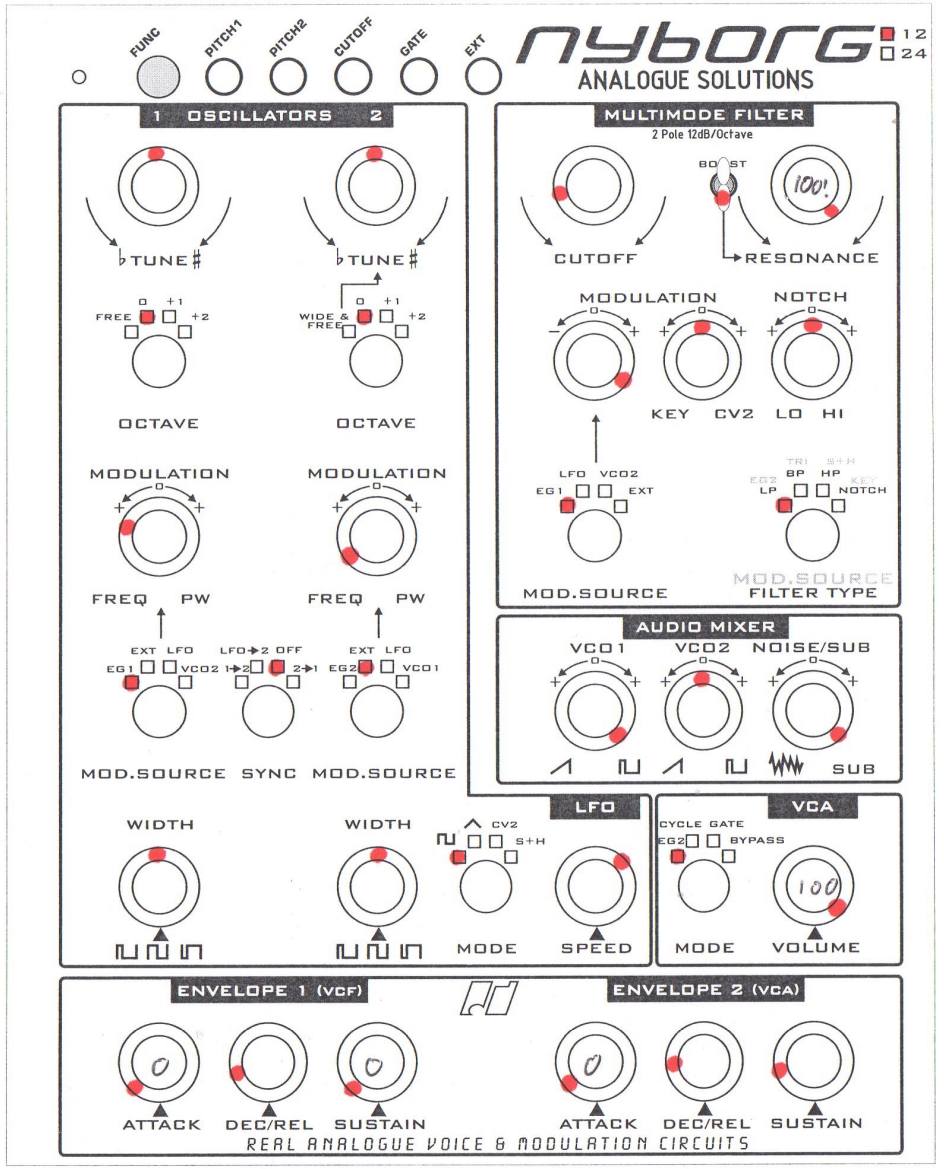
PATCH NAME: KICK DRUM COMMENTS:

PROJECT:



SET CV2 TO: ■ VELOCITY □ .....

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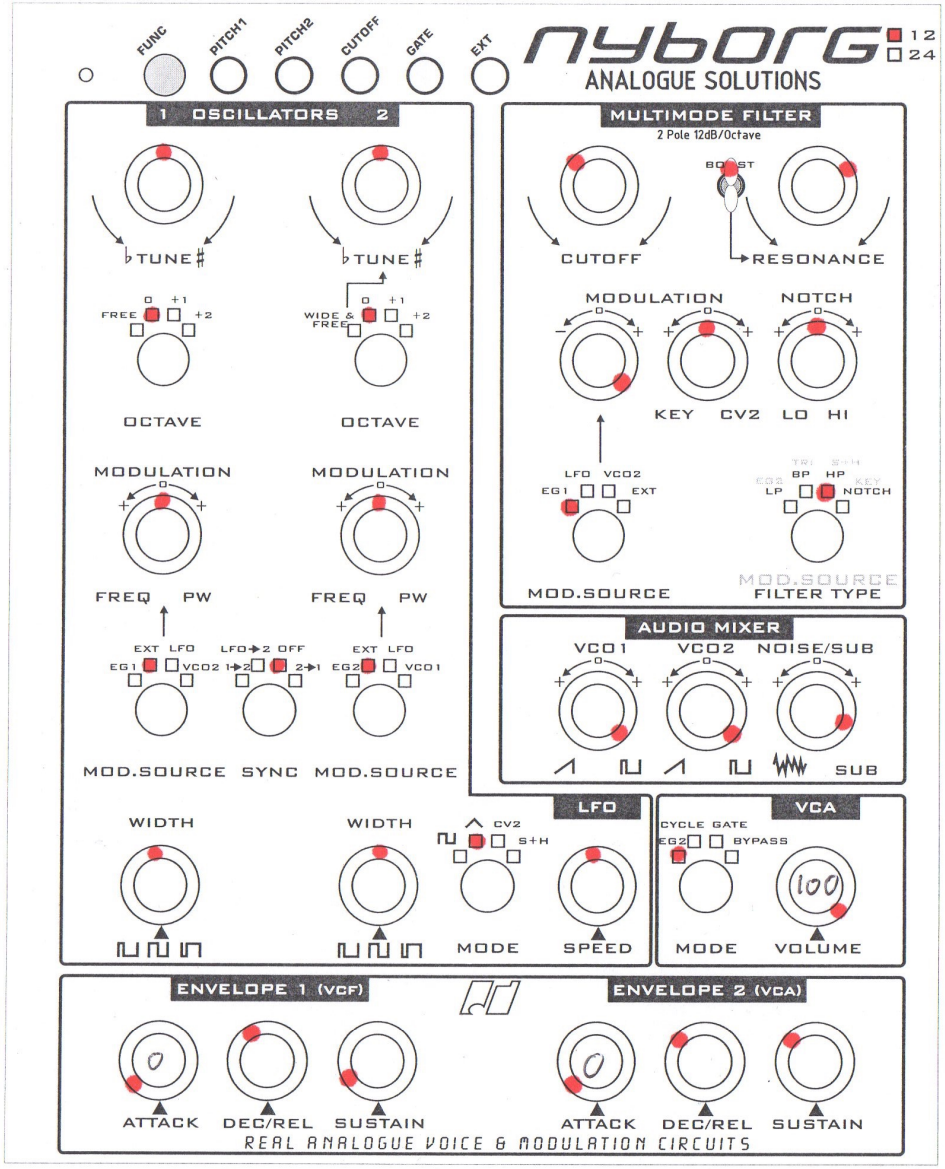
PATCH NAME: OBERHEIM GROWL COMMENTS:

PROJECT:



SET CV2 TO: ■ VELOCITY

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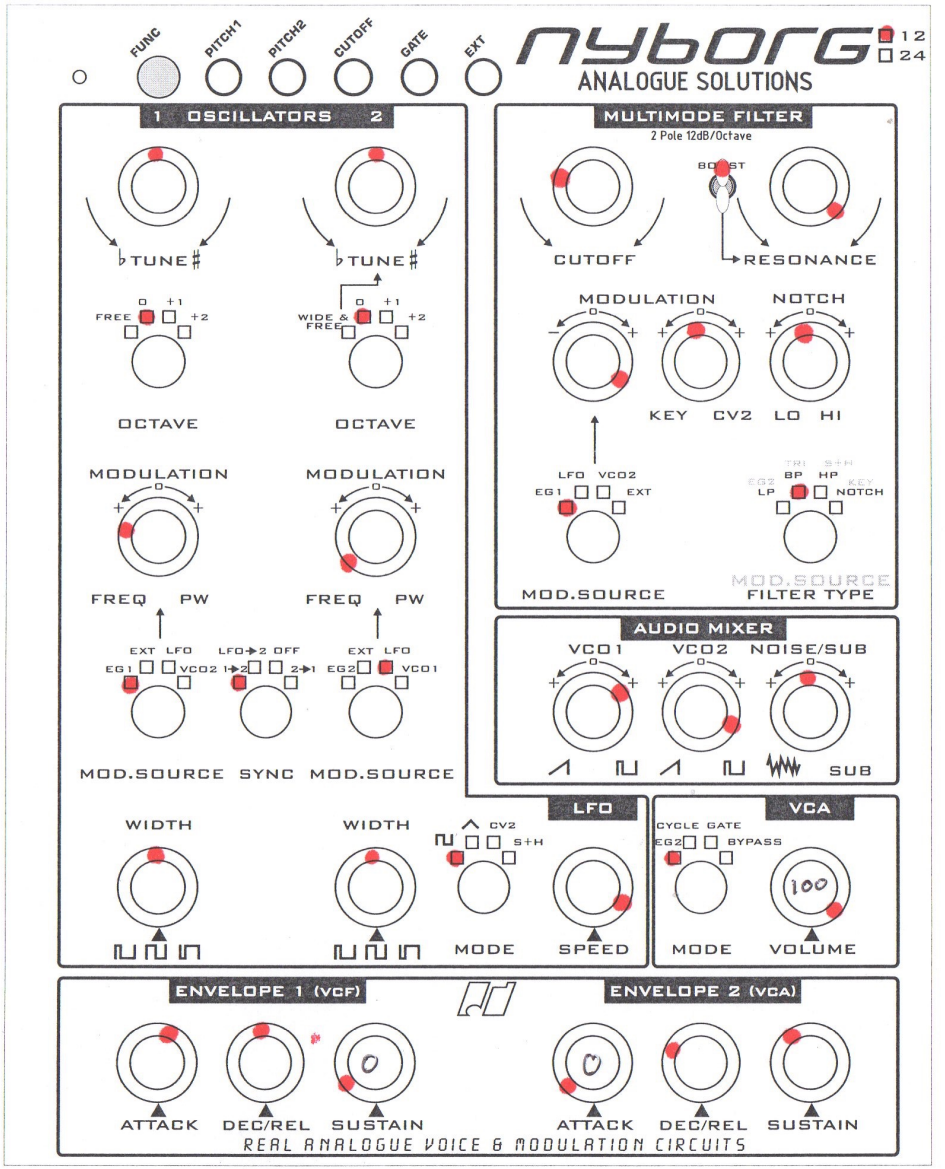
PATCH NAME: FREAKY CAT COMMENTS:

PROJECT:



SET CV2 TO: ■ VELOCITY

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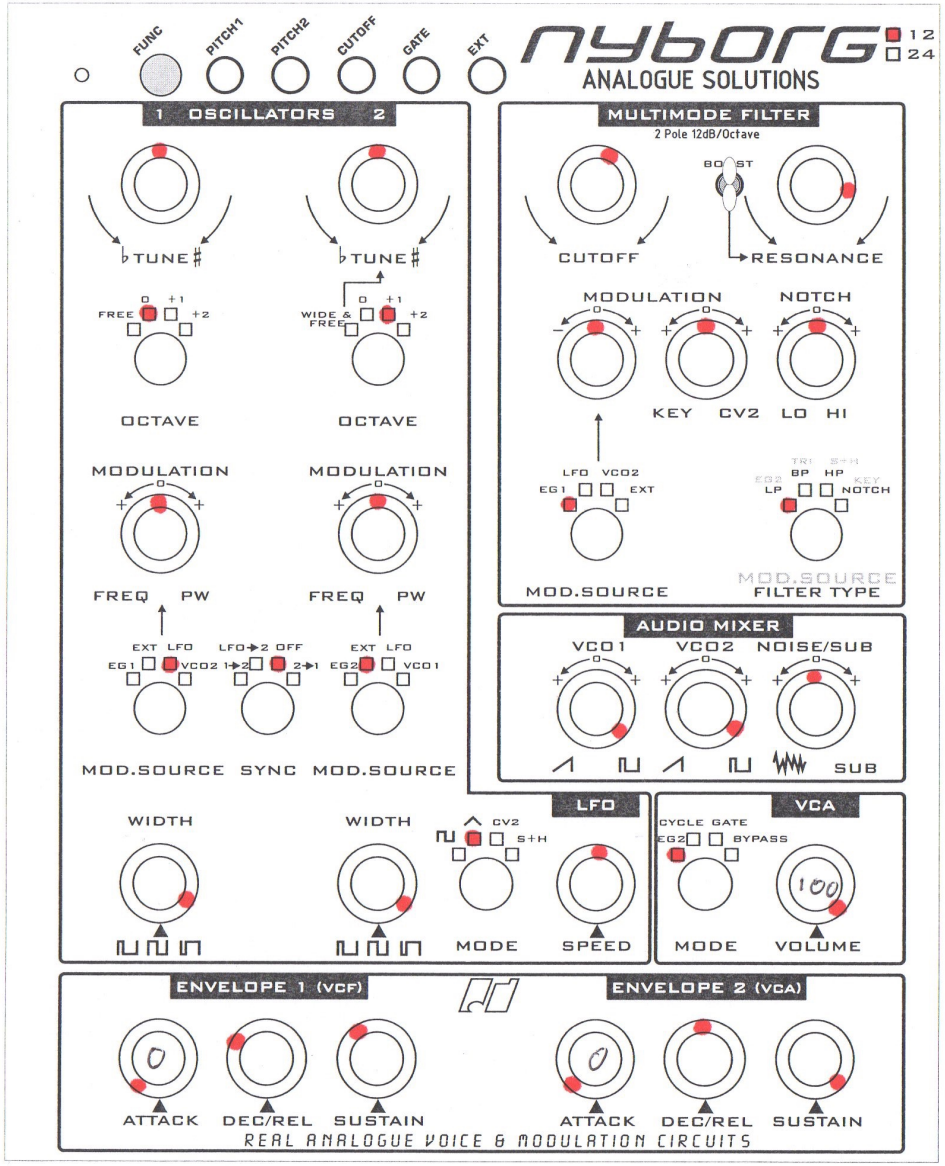
PATCH NAME: FANTASY PIANO II COMMENTS:

PROJECT:



SET CV2 TO: VELOCITY .....

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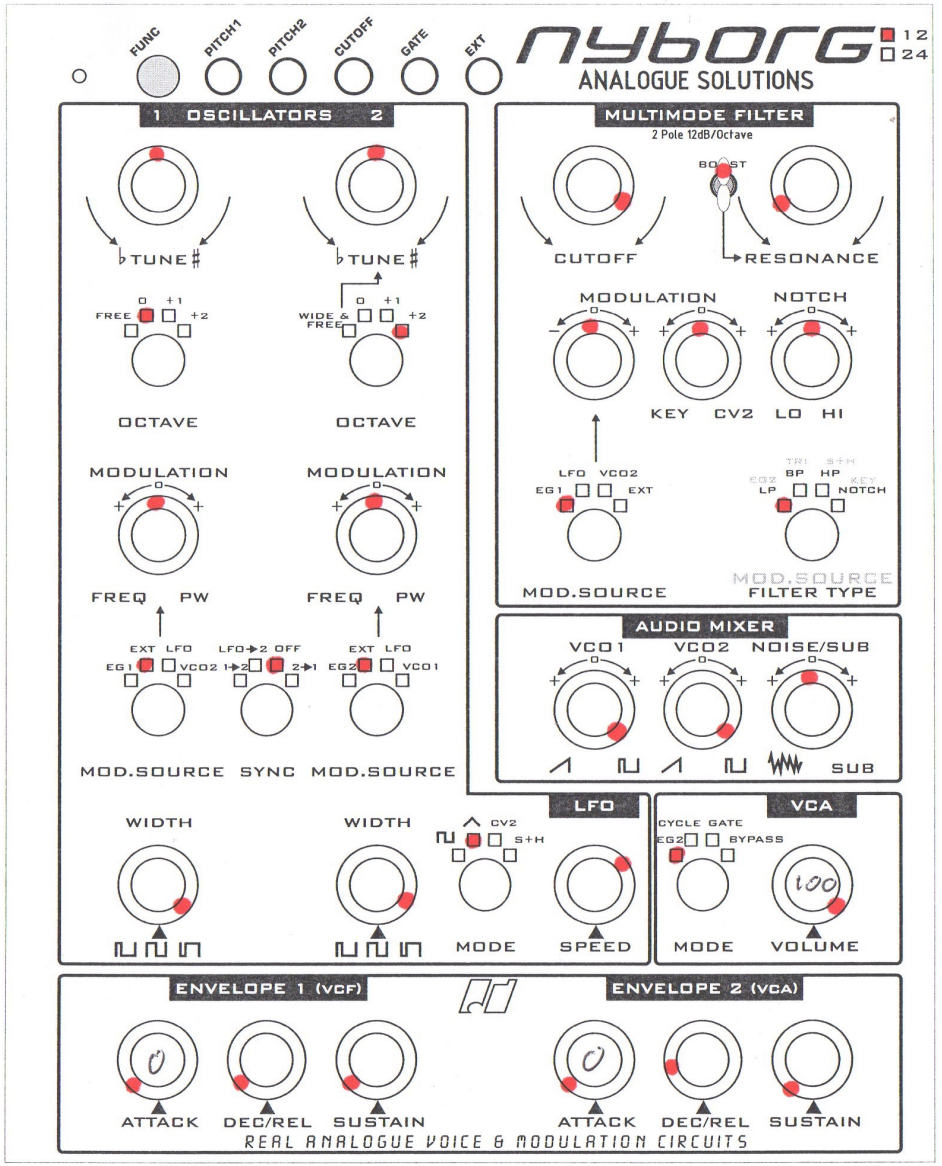
PATCH NAME: HARPSICHORD COMMENTS:

PROJECT:



SET CV2 TO: VELOCITY .....

NYBORG PATCH SHEET

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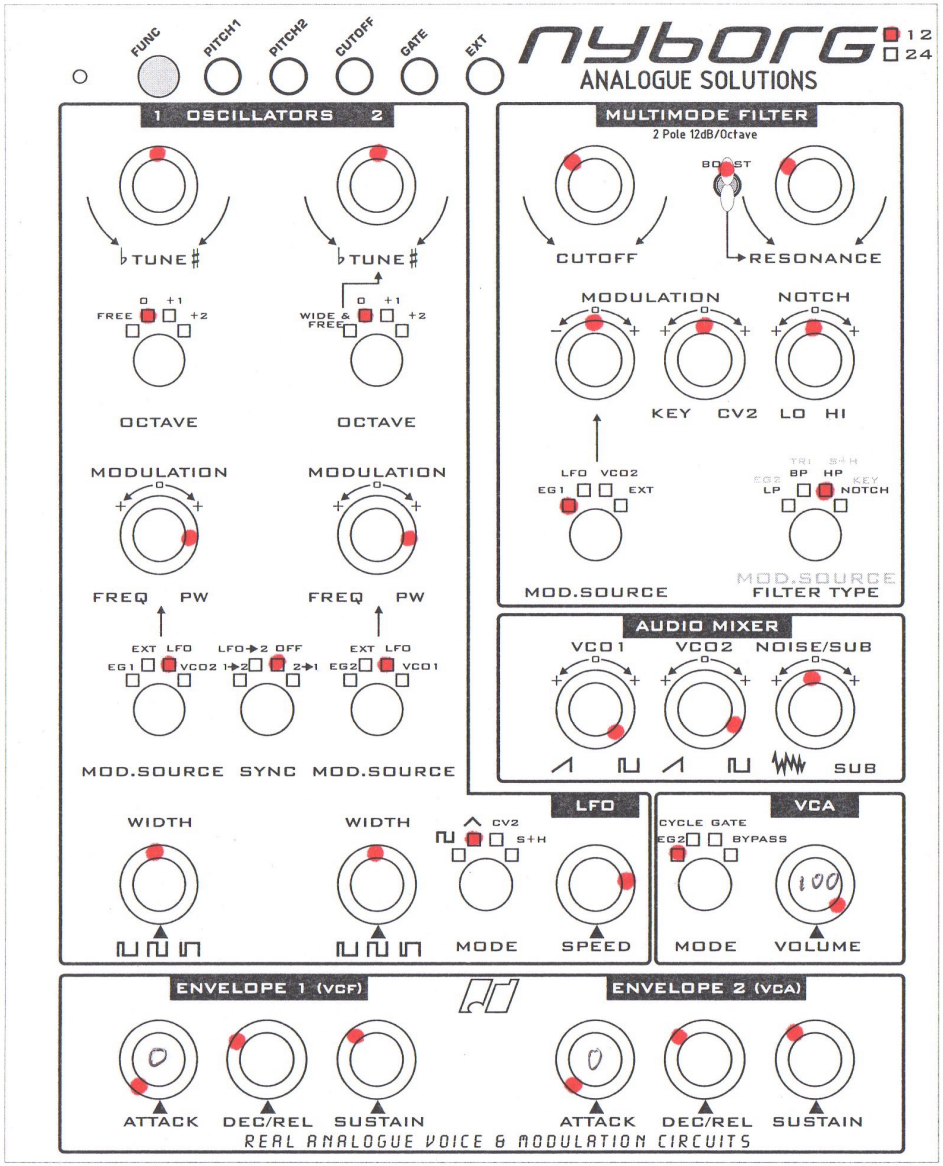
PATCH NAME: Pulse Lead COMMENTS:

PROJECT:



SET CV2 TO: ■ VELOCITY

□ .....

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NYBORG PATCH SHEET

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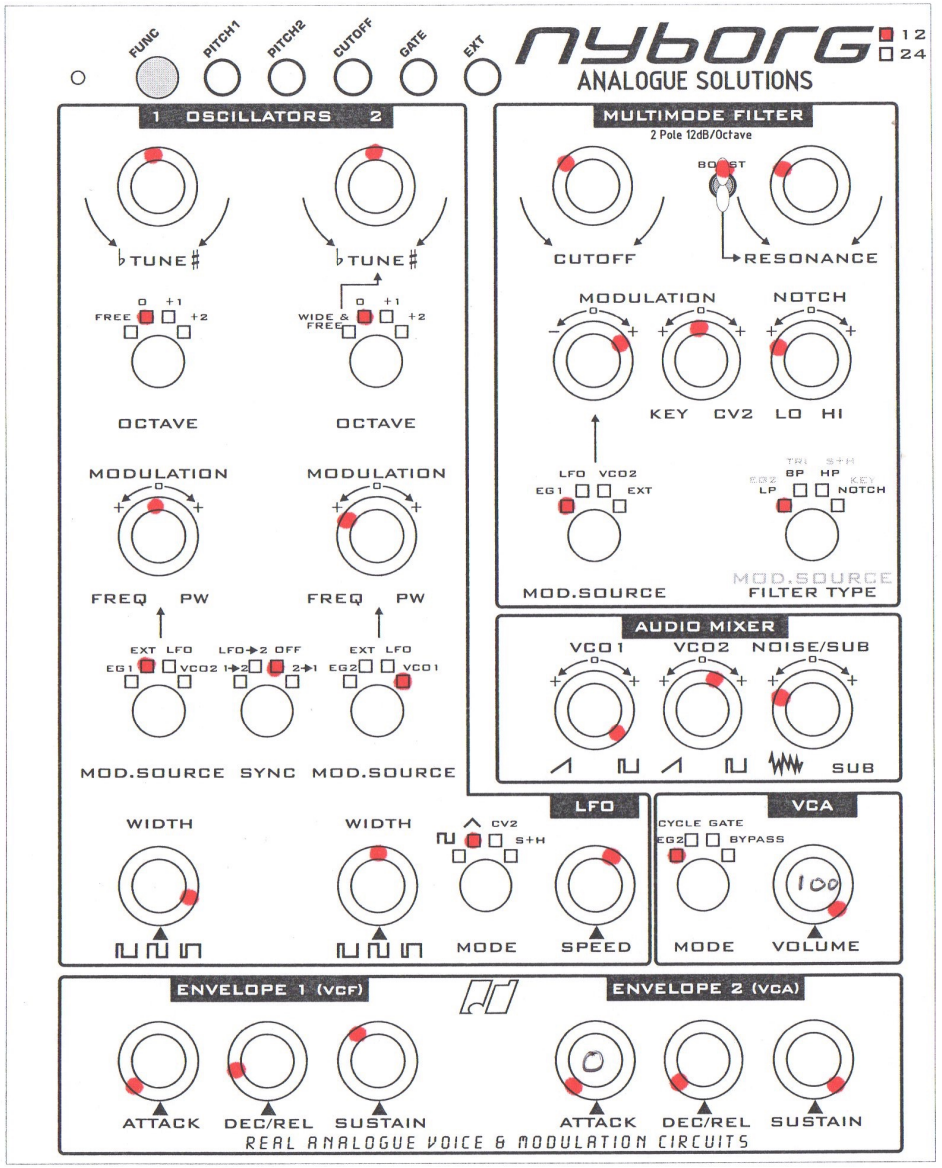
PATCH NAME: Synthe Bassoon COMMENTS:

PROJECT:



SET CV2 TO: ■ VELOCITY

□ .....

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NYBORG PATCH SHEET

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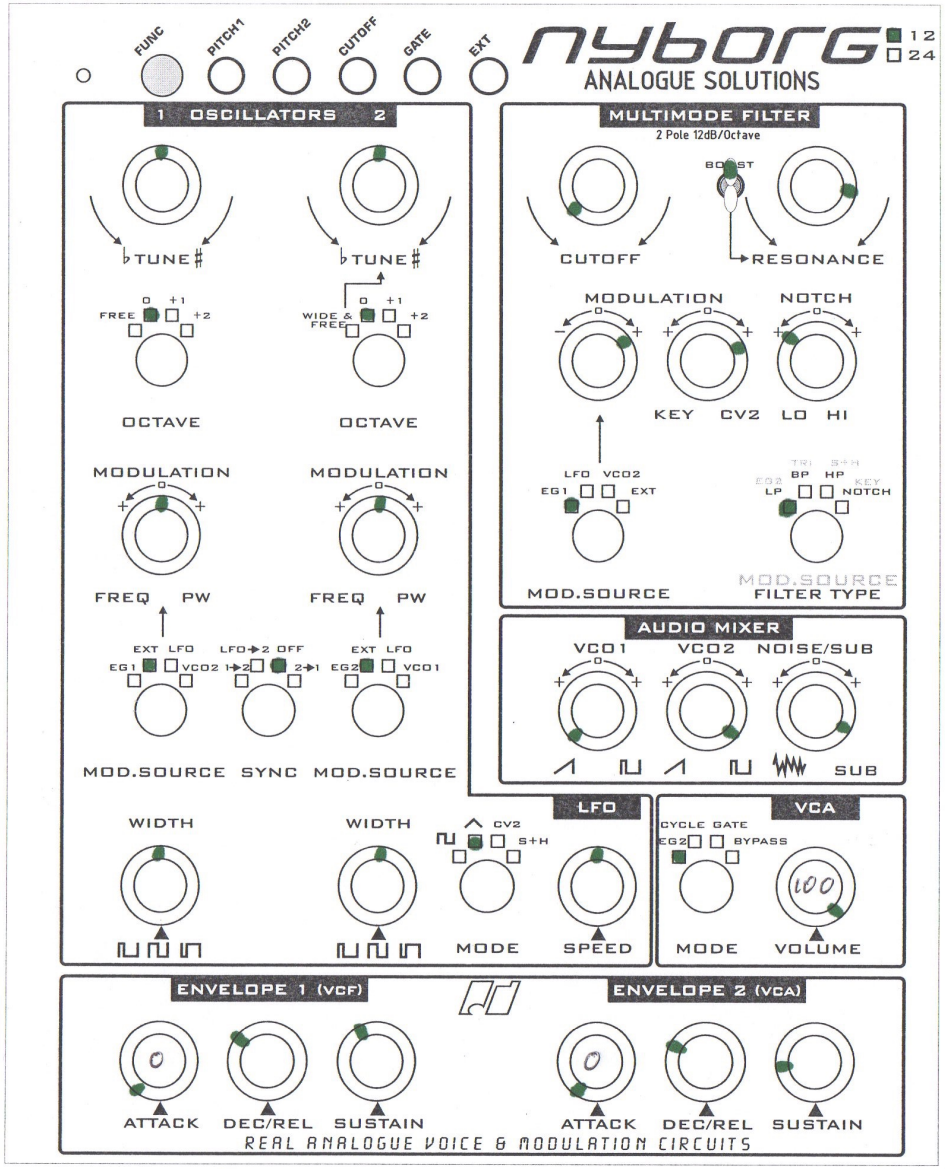
PATCH NAME: ANGRY BASS COMMENTS:

PROJECT:



SET CV2 TO: ■ VELOCITY
□ .....

NYBORG PATCH SHEET
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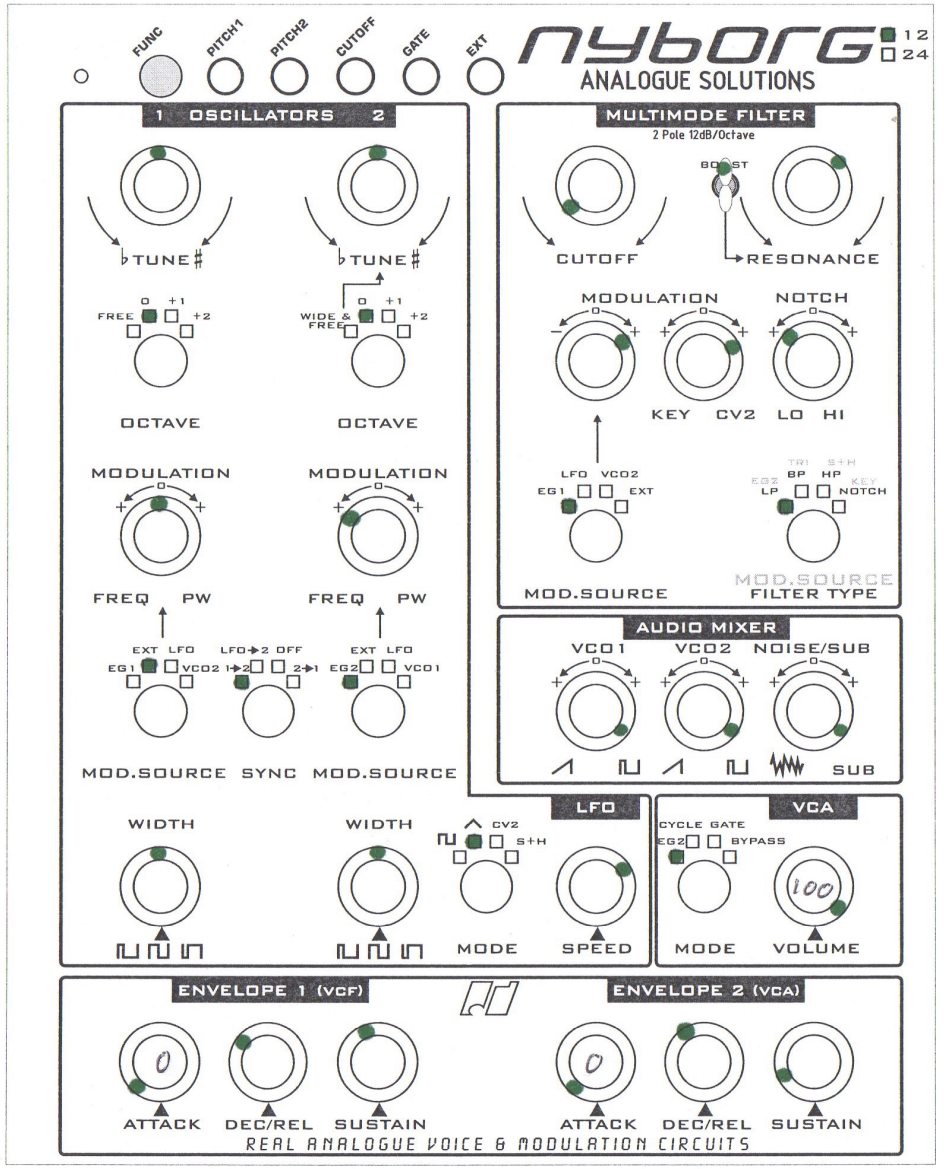
PATCH NAME: VIOLENT BASS COMMENTS:

PROJECT:



SET CV2 TO: ■ VELOCITY
□ .....

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ENSURE CV2 IS CORRECTLY SET.
WHEN COPYING A PATCH - PLAY WITH SETTINGS!

Setting MIDI Receive Channel

FUNC(TION) PUSH BUTTON

This button is used to set the MIDI channel and CV2 controller.
Works best if you plug a MIDI keyboard direct to program rather than via a DAW.

To change the MIDI channel and CV2 controller;
Press and hold the FUNC button.
Press a MIDI key or move a MIDI controller.
Release the key/controller. Then release the FUNC button.
The synth will set its MIDI receive channel to the same channel of the MIDI message that was received.
CV2 will be set to Velocity if you used a MIDI key or to the same controller number of the controller that was moved.

If it doesn't work first time, try again! Then, still if not, try another keyboard. Also check your cables are not faulty**.**

Rear Panel Connections

F1 IN: This is an audio input socket to feed audio signals directly into mixer.

F2 IN: This is a second audio input socket to feed audio signals directly into mixer.

OUT: This is the main audio output from Nyborg. It is the signal output from the VCA, post Volume control.

MIDI IN: Plug your MIDI cable in here to all another MIDI device to control the Nyborg.

MIDI THRU: The MIDI data coming into the In socket is copied to the Thru socket. This is so you can control additional devices from your MIDI controller without the need of a MIDI thru box. The Thru socket will not function when in Poly mode.

Blank Patch Sheets

Print off or use a patch pad

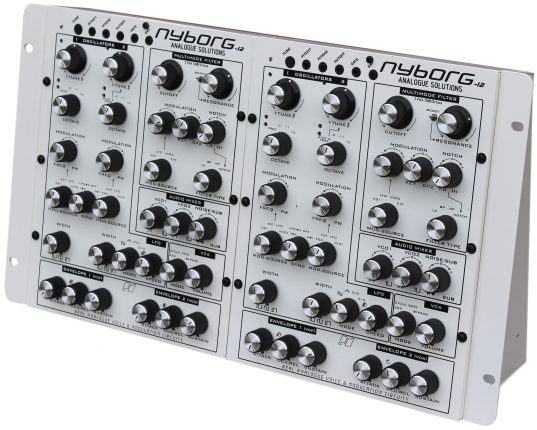
‘Preset’ Patches

Try these patches. Play around with the settings to tweak to your liking.

Changing Mechanical Configuration

FITTING RACK EARS

Rack ears are optional.
To rack mount Nyborg, you will in fact need two of them, as the combined width makes up one whole rack width. A single Nyborg cannot be rack mounted since they are half rack width,



First the two Nyborgs but be screwed together side by side. This involves removing the front panel. See 'Removing Front Panel' in the wood side panel fitting instructions.
With the front panels removed carefully screw the units together using 4 M4 screws. Use the four threaded holes that are normally used for the rack ears/wood.
Optionally you could fit nylock nuts too, or use thread-lock if you expect vibration to work the screws loose (for example if they will be transported a lot).
Next, replace the front panels.

Finally, screw the rack ears to the sides of each Nyborg using M4 screws.

FITTING WOOD SIDES

Wood sides are optional.
They can be fitted to a single Nyborg, or, two Nyborgs that have been bolted together (see above, 'Fitting Rack Ears').
The wood is screwed from the inside. This is so no screws are visible from the outside which looks far smarter.

Unplug From Mains.
Remove 5 front panel screws.
Carefully unplug cable internal ribbon. There may be some hot glue securing it. Simply pull that off with a pair of pliers.
Set aside Front panel.
Put the wood on the table.

Place the synth on its side on the wood.

Adjust position carefully. Typically set the front of the Nyborg back at least 5mm from front edge of wood, or just place Nyborg centrally on the wood.
Screw Nyborg to the wood using self tap screws. It is not necessary to drill any pilot holes.
Be careful not to strip the thread by over tightening.
Repeat for other side.
Then reassemble.
Ensure that you plug the cable back in correctly! The connector is keyed so it is hard, but not impossible, to plug in incorrectly. Do not force it in.

CHANGING FROM VERTICAL TO HORIZONTAL ORIENTATION

As standard, Nyborg is a vertical machine much like its big brother, the Telemark.
It is possible to rotate the front panel, and move the MIDI/PSU PCB so that you can have the synth flat, like a desk top device.
This involves some basic mechanics.

First, the front panel must be removed and rotated 180 degrees. Removing the front panel is described in ‘Fitting Wood Sides’ as outlined above.
Next you need to remove the MIDI/PSU PCB. This is one screw and 3 jack socket nuts.
The two overlays must be removed and their positions swapped. (Overlays are the ‘stickers’ on the case).
To remove these, first gently warm up the glue with a hair drier, then carefully peel off.
Set these aside glue side up.
If any glue is left on the case clean off with isopropanol alcohol.
Then refit the overlays in their new position. If there is not enough stickiness in the glue you will need to re-glue. Alternatively, you can purchase a new set of overlays.
Refit the MIDI/PSU PCB in the new position.
Remove 4 rubber feet and fit in new position.
Fit front panel in new position.

Whether rotating the front panel, fitting wood, or, screwing 2 units together, the task is fairly simple, and basic engineering common sense is all that is needed. Doing these won’t invalidate your warranty. But doing something stupid like snapping something, slipping and mashing the PCB, etc will! And these will be very evident.

nyborg-12
ANALOGUE SOLUTIONS
1 OSCILLATORS 2
MULTIMODE FILTER
CUTOFF
RESONANCE
MODULATION
NOTCH
OCTAVE
FREQ PW
MOD.SOURCE SYNC MOD.SOURCE
FILTER TYPE
AUDIO MIXER
VCO1 VCO2 NOISE/SUB
SUB
LFO
VCA
WIDTH
MODE
SPEED
VOLUME
ENVELOPE 1 (VCF)
ENVELOPE 2 (VCA)
ATTACK DEC/REL SUSTAIN
REAL ANALOGUE VOICE & MODULATION CIRCUITS

2 Voice Mode / Poly Chain

Nyborg has modified software to add poly-chain to accommodate one other synth.
This will allow 2 Nyborgs to be played together as a single 2 voice polysynth. (4 voice is possible too on request - if you are lucky enough to own 4 Nyborgs, but you will need some new software).

TO CONNECT THEM UP:

Set the Slave Nyborg to MIDI channel 2
Plug your MIDI keyboard to the MIDI In of the Master Nyborg
Connect the MIDI Thru from the Master Nyborg to the MIDI In of the Slave Nyborg
To activate the Poly mode, Press and hold the FUNC button whilst powering up the Master Nyborg. (Do the same to toggle it back to normal mono mode). Poly / Mono mode is remembered in non-volatile memory.
There is no need for the Slave Nyborg to have the special software or be in any special mode, just as long as it is set to Channel 2

note; Pitch bend is not passed through. The poly mod is fairly basic (for example there is no note buffer) but it suffices as a 'free' extra and works well enough!

If you are using a single Nyborg and you find it acting a little strange, it could be that it is in poly mode, in which case, toggle it back to mono mode.

No Signal?

Check the following…

- Your mixing desk / monitoring equipment is on and working correctly.
- Check the synth is switched on and that the power adaptor is functioning correctly.
- Check it is connected to your monitoring equipment correctly and that the cable is not faulty.
- Ensure the output volume is high enough.
- Ensure the mixer level controls are turned to some sound source like the VCOs or Noise.
- Certain extreme filter settings may filter out all of the signal or produce low level signals. Try adjusting the filter cut-off.
- Certain extreme PW/PWM settings may cause the pulse outputs to cut-out. Try adjusting PW/PWM as necessary.
- Try putting the VCA to BYPASS to hear the raw sound, but if you are using a MIDI keyboard to trigger the envelopes and VCA, ensure correct MIDI connection, and that the correct channels have been selected.

Internal Calibration of internal VCOs

Calibration of Nyborg is done at the factory and usually should not need to be changed. Only attempt this yourself if you are fully confident you can do it. You may just end up ruining the settings, and be aware calibration is something that we cannot help with other the phone. There are no additional guides we can give by phone to help that are not already printed here.

Trimmers

There are 3 trimmers per VCO, arranged in a vertical line accessed through small holes in the top panel.

- Top trimmer is Scale
- Middle is Hi-Track
- Bottom is Tune.

VCO1

1. Monitor VCO1.
2. Turn Fine and Course Tune controls to centre.
3. With MIDI connected, play C4.
4. Monitor the VCO1 output, and adjust bottom trimmer (tune) until the pitch of VCO matches your reference of a 'C' note (reference using guitar tuner, digital keyboard, etc.).
5. Play C3.
6. Adjust the top trimmer (Scale) until it matches your reference of a lower 'C' note.
7. Repeat steps 3 to 6 several times until all is in tune and a good octave is obtained.
8. Play C6 and adjust the middle trimmer (Hi-Track) until it matches your reference.
9. Repeat steps 3 through 8 until all is in tune.

VCO2

1. For VCO2 you repeat the above steps VCO1 can be used as a reference instead of a tuner, using the zero-beat method.

Specification Nyborg 12

VCO1	Tune, Octave, PW Mod, FM Mod, Manual PW, Mod Source, Saw out, Pulse out, Sync, Free Run
VCO2	Tune, Octave, PW Mod, FM Mod, Manual PW, Mod Source, Saw out, Pulse out, Sync, Wide Range
VCF	Low pass filter, High pass filter, Band pass filter, Notch filter, Variable Notch filter. Cut-off, Resonance, Modulation Amount, Mod Source, MIDI Mod, Resonance Boost
Mixer	Audio source mixer
VCA	Mode switch inc. EG Repeat, Output volume
EG1	ASR envelope with trigger LED
EG2	ASR envelope with trigger LED
LFO	Speed, Output Mode (Square, Triangle, Velocity CV, S+H)
Noise Generator **Sub Osc**	White noise Minus one octave, taken from VCO1
Sample and Hold	For random modulation effects
MIDI to CV Converter	16 bit high resolution with auxiliary controller CV2 output
Rotary controls **Rotary switches** **Push button** **LEDs** **Jack sockets** **MIDI Sockets**	22 9 1 4 3x 6.35mm, 5x 3.5mm 2
Dimensions:	(W x D x H) 212x130x270mm 6U
Weight:	X Kg
Power:	External AC mains supply
Accessories:	Mains adaptor

Warranty

Nyborg comes with a 1 year (from purchase date) back to base warranty, (i.e. customer must arrange and pay for carriage to and from Analogue Solutions or the dealer from which purchased).

This warranty shall not apply where the product has been subject to alteration, misuse accident, neglect (such as extremes of temperature and/or moisture) or to wear resulting from normal use.

At the sole discretion of Analogue Solutions, the warranty is deemed to be void should the unit be or considered to have been opened or any other modifications or tampering be carried out by unauthorised parties.

CE COMPLIANCE

This unit complies with EU Directives 73/23/EEC and 89/336/EEC.
Standards: EN55103-1, EN55103-2, EN60065

CE